

EXECUTIVE SUMMARY

Project Title: Last Chance Creek Watershed Restoration Project—Ferris-Meadowview Reach -- Feather River Coordinated Resource Management (FR-CRM)

Project Description: The Last Chance Creek watershed, above the FR-CRM Doyle Crossing trend monitoring station, is a 90,000 acre forest and meadow ecosystem in the headwaters of the East Branch, North Fork Feather River (EBNFFR). 98% of the watershed is in the national forest system managed by the Plumas National Forest. Prior to Euro-American settlement the ecosystem functioned as a hydrologic sponge, absorbing and storing water from winter rains and spring snowmelt in subsurface aquifers, soils and streambanks, then slowly releasing this retained water as high quality, cold temperature baseflow to the river system through the summer and fall. The extensive system of meadows that border the Last Chance Creek channel and its tributaries were critical to this water retention/release process as well as serving as long-term storage of watershed sediments. The Last Chance watershed meadow system is the longest contiguous meadow complex (37 miles) in the Sierra Nevada drainage area of the Sacramento River. However, these critical ecosystem functions have been lost as a result of 125 years of cumulative impacts, including timber harvesting, wildfire, historic grazing and roadbuilding. Functioning meadow systems have been replaced by incised channels and lowered water tables, which has dramatically altered the timing and magnitude of flow. This response negatively impacts Bay-Delta species and beneficial uses.

Primary Biological/Ecological Objectives: The proposed restoration project on the Ferris-Meadowview reach, is a major component of the FR-CRM's far-reaching, collaborative effort to restore hydrologic function and meadow condition in the Last Chance Creek watershed. Objectives include restoring 9.1 miles of channel and 4330 acres of meadow by returning streamflow to abandoned remnant or reconstructed channels and rehabilitation of 1 mile of county road through relocation and/or surfacing. These efforts are expected to provide the following benefits:

- Increase summer baseflows for priority species and beneficial uses: an estimated .2- .4 acre feet/acre annually
- Improve water quality by reducing temperature and sediment
- Potentially decrease magnitude of floods
- Enhance current efforts to accurately monitor and quantify the above benefits
- Waterfowl/wetland enhancement
- Educate the public and provide technology transfer to adjacent watershed efforts

Cost: The Ferris-Meadowview project is expected to cost \$980,000.00

Local Support/Coordination: This project will be a major component of the ongoing Feather River CRM and USFS- Plumas National Forest restoration efforts in the Last Chance Creek watershed. Several early FR-CRM studies (EBNFFR Erosion Inventory Report, Soil Conservation Service, 1989; Cumulative Watershed Effects (CWE) Analysis, USFS, 1990; Non-Point Source Water Pollution Study, CWA Section 205j, Plumas Corporation, 1992) identified the Last Chance Creek watershed as one of the most severely dysfunctional subwatersheds in the

EBNFFR. The Plumas National Forest, Beckworth Ranger District is nearing completion a Watershed Analysis of the Last Chance Watershed as a precursor document identifying resources issues/concerns as well as management/restoration opportunities. The direct project area is under both private (30%) and federal (70%) ownership.

The first FR-CRM project in the Last Chance watershed was the Big Flat/Cottonwood Creek Project (1995), which has successfully demonstrated the meadow re-watering concept. The identified opportunity for extensive meadow re-watering in Last Chance has resulted in the establishment of a trend monitoring station at Doyle Crossing (funded by a grant from the Regional Council of Rural Counties-RCRC) to measure streamflow and temperature changes at the watershed scale. Operation of the Doyle Crossing station continues under a 319(h) grant as well as monitoring funds from future projects such as this.

Monitoring: The FR-CRM has consistently conducted qualitative and quantitative monitoring of projects, both for overall success and effectiveness as well as the function of specific techniques within the projects. This effort has led to immediate feedback (adaptive management) into subsequent design and implementation planning. Vegetative response, reversing the trend toward xeric (sagebrush, cheatgrass) species back to a hydric/mesic vegetation community (carex, salix), has been a consistent indicator of restored meadow hydrology. Temperature has been another strong indicator, easily monitored, that points toward a successfully restored water retention/release function. Overall project change can be most graphically illustrated by the establishment of photo points overlooking the project area. The Doyle Crossing trend station is intended to track changes in streamflow and temperature at the watershed scale resulting from the cumulative effects of this as well as other projects.

The Last Chance Creek watershed has a system of permanent monitoring reference sites that were established by the California Department of Water Resources (DWR). These sites consist of physical, biological and chemical data initially collected in June, 1998 on selected tributaries and the main stem of Last Chance Creek. Three of these baseline stations are within the proposed project area and would continue to receive regular remeasurement.

Adverse/Third Party Impacts: There are no foreseen adverse impacts to on-site or downstream resources beyond the unlikely event of complete project failure and resultant return to its existing condition. To date, similar projects have not shown that trend. Potential third-party impacts may be 1.) changes in grazing management schedules to allow full vegetative recovery for the project areas; 2.) closure/obliteration of short spur roads adjacent to the project areas. These issues will be cooperatively addressed with landowners/users through the CRM process. Please see attached letters of support from landowners/managers.

Applicant Qualifications: The Feather River Coordinated Resource Management group is a 21-entity consortium of Federal, state and local public, private agencies and academia dedicated to improving the health and function of the 3,222 mi² upper Feather River through the CRMP process. Plumas Corporation, a 501(c) (3), non-profit organization has been the primary implementation/coordination agency for the Feather River Coordinated Resource Management group projects. The FR-CRM has been sponsoring the implementation of stream/meadow restoration projects since 1985 which have totaled over \$6 million dollars.

The goals of this project are to 1) quantify export loads of DOC and DBPPs from a tidal wetland, a non-tidal wetland, and an agricultural operation; and 2) assess the potential change in contributions of DOC/TOC and DBPPs from changes in land use from agriculture to wetlands.

Study Design:

Only a small fraction of DOC – the disinfection byproducts precursors (DBPPs) – form DBP, and the amount of DBPPs within DOC is highly dependent on the source and extent of degradation of the organic material. Samples from different areas in the Delta have over a 10-fold difference in the amount of DBPPs found within the DOC, on top of the 10-20 fold differences observed in DOC concentration. No studies to date have quantitatively assessed the biogeochemical processes influencing the relative contributions of DOC and DBP precursor sources in the Delta. We propose to quantify the DOC/TOC and DBPP loads from tidal wetlands, non-tidal wetlands, and agricultural operations, and assess their relative importance as sources of carbon for the Delta foodweb and for drinking source water quality.

The companion proposal (Part I) focuses on the concentration and quality of DOC/TOC released from different carbon sources to the Delta (wetland types, rivers, and agricultural activities), assessing both DBPPs and the incorporation into Delta foodwebs, and determines how microbial alteration affects the composition of DOC and DBPPs. This proposal (Part II) mainly focuses on the amounts (loads) of DOC and DBPPs contributed by tidal and non-tidal wetlands and agricultural operations. Together these two proposals should provide the quantitative and qualitative knowledge needed for CALFED to make informed decisions regarding ecosystem and human health.

A team of scientists with diverse expertise has been assembled to address these issues. Principal investigator Roger Fujii, who will bear responsibility for all scientific products, will lead the team. The various team members bring a wealth of scientific experience in carbon release from peat soils, estuarine transport of sediment and other constituents, physical and chemical processes affecting peat soils, wetland ecology, chemical characterization of natural organic material, organic geochemistry, and the chemistry of DBP formation. The progress and products of the study will be monitored by an independent scientific advisory panel composed of internationally recognized experts in DOC release from wetlands, chemical characterization of DOC, aquatic food web interactions, water treatment, and DBP formation. The final reports will analyze and synthesize the experimental results to identify specific options to CALFED regarding the potential impacts of different restoration actions on drinking source water quality and DOC-supported biological production in the Delta.